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ABSTRACT

In this paper the authors extend an earlier study that developed images of what schools are like as social entities. That study found that elementary schools correspond to the rational bureaucratic image, whereas secondary schools are more loosely coupled systems. The study was limited by a small sample. In this paper the research was extended to a larger sample of schools and utilized a more extensive analytic approach. Again the finding was that high schools fall into organizational structures of the loose coupling type, and elementary schools tend to group into organizational structures of rational bureaucracies. There is evidence that it is easier to implement change in schools with relatively tight organizational structures. This suggests a basic dilemma for reform of high schools. Major reforms may require basic changes in structural arrangements, staffing, and service mix. Unless major changes are made, it seems unlikely that substantial reform will be accomplished. Included with the paper are tables and figures tabulating the data analyzed and five pages of references. (MD)

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# TWO IMAGES OF SCHOOLS AS ORGANIZATIONS:
# A REPLICATION AND ELABORATION

In a recent paper in this journal we argued that one of the major tasks for contemporary research in educational administration is to discover, develop, and refine "images" of what schools are like as social entities.[1] We explicated two images that have received substantial attention from researchers, that of the rational bureaucracy and of the anarchy or loosely coupled system. The rational bureaucracy image emerged from the writings of many scholars drawing upon the influential work of Max Weber more than fifty years ago.[2] As explicated by Robert Merton, the rational bureaucracy is a formally organized social structure with clearly defined patterns of activities in which, ideally, every series of actions is functionally related to the goals of the organization.[3] The anarchy or loosely coupled system image is based largely on the more recent work of James March, John Meyer, and Karl Weick and has generated considerable interest and controversy among those who study schools as organizations.[4] This image applies to organizations where goals are ambiguous, hierarchies of authority are not effective integration mechanisms, and technologies are unclear.

In an illustrative empirical test of the expectation that schools do not conform exclusively to either image, we operationalized the rational

bureaucracy and loosely coupled system in terms of two variables central to a distinction between them: goal consensus and centralization of influence.[5] Since the rational bureaucracy is a purposive organization with a formal hierarchy of control, we argued that conformity to that image would be exhibited by a high degree of both goal consensus and centralization of influence. By contrast, goals are relatively unimportant in a loosely coupled system and influence more diffuse so we argued that conformity to that image would be reflected in low scores on both variables. We found support for our expectation that some schools would correspond more to the rational bureaucratic image and others to that of the loosely coupled system. Moreover, much to our surprise, we found that elementary schools corresponded much more closely to the rational bureaucratic image while secondary schools were more like loosely coupled systems. However, the measures we used were rather crude and we were limited to a very small convenience sample. Here we extend that analysis by using more refined measures, a much larger sample of schools, and a more extensive analytic approach. In so doing we both replicate the original finding and elaborate on why elementary and secondary schools seem to represent substantially different organizational forms.

## Sampling Considerations

The data for this replication of our earlier study come from two highly comparable samples. The first, with 50 schools, was selected randomly in 1981 from a population of 1407 schools within a 15-county region of southeastern Pennsylvania.[6] The second, containing 61 schools, was drawn less systematically in 1983 from a less precisely defined

population of schools within the states of New Jersey and Pennsylvania.[7] After comparing the two samples carefully on all variables relevant to this replication, we concluded that the enhanced analytic stability to be gained by pooling the two samples far outweighs any disadvantages associated with such pooling.[8] Unless otherwise noted, the results presented in this paper are for the pooled sample of 111 schools.

## Measurement of Key Variables

The approach of this replication study builds on that of the earlier study, but uses more rigorous measures of the three key variables: goal consensus, centralization of influence, and school level. As in the original study we asked all experienced teachers in each school to serve as our informants and to complete a group administered School Organization Description and Analysis (SODA) questionnaire developed by Research for Better Schools, Inc.[9]

### Goal Consensus

To measure goal priorities in each school we asked each teacher to rank order seven "areas of student development" in terms of "how important they are to you as a member of this school." The areas are:

1. Appreciation and striving for excellence (in school work or other areas).
2. Critical and original thinking.
3. Basic skills (reading and math).
4. Respect for authority (discipline, character building, etc.).
5. Vocational understanding and skills.

6. Understanding others (cultural pluralism, getting along with peers, etc.).

7. Self-esteem (self-concept).

As our measure of goal consensus, we computed Kendall's coefficient of concordance for each school.[10] This statistic is analogous to the average rank order correlation across the seven goal areas for all pairs of respondents within each school. The resulting goal consensus scores could have ranged from a low of .00 (complete randomness in the rankings of seven goal areas by the teachers within a given school) to a high of 1.00 (all teachers providing identical rankings). The observed scores exhibited substantial variability (Table 1).

Centralization of Influence

To measure centralization of influence we asked teachers to report separately on a four-point scale (0 = low; 3 = high) the degree of influence of "teachers" and "the principal" over the following four decision areas:

1. Selecting required texts and other materials.
2. Establishing objectives for each course.
3. Determining daily lesson plans and activities.
4. Determining concepts taught on a particular day.

To obtain a measure of "centralization of influence" as reported by each teacher for each decision area we subtracted reported teacher influence from reported principal influence. For each decision area we then conducted a one-way ANOVA to be assured that between-school variation in these teacher reports was substantially greater than within-school

variation.[11] We then averaged the resulting scores for each decision area across all teachers in each school to produce four influence subscores. The Cronbach's Alpha across these four subscores in the random sample was .83, suggesting the existence of a highly reliable scale. The scale was then formed by averaging the four subscores for each school and adding the constant three to avoid negative scores.

Centralization of influence scores could have ranged from a low of 0.00 (teachers have major influence over all four decision areas and the principal has none) to a high of 6.00 (teachers have no influence over all four areas and the principal has major influence). Although teachers never reported that the principal had more influence than they did in the four areas of classroom decision making (a score of 3.01 or greater), variation was marked (Table 1).

School Level

One of the more prominent, yet poorly understood, characteristics of American public schools is that of school level, the distinction among elementary, junior high and senior high schools. Most studies of schools as organizations focus exclusively on a single level thus inhibiting systematic comparison of different levels.[12] To summarize variation in school level, we arrayed the 111 schools according to the lowest and highest grade each contained (referred to as "grade span") and assigned each school to one of three groups by inspection (Table 2). The senior high group is most homogeneous in grade span, including 23 schools with either a 9-12 (14 schools ) or a 10-12 (9 schools) pattern. The 23 junior high schools are a bit more heterogeneous, containing 4 distinct patterns

dominated by 9 schools having a 6-8 and 8 with a 7-9 span. The elementary schools are by far the most heterogeneous group, with 13 distinct spans, but 37 of the 58 schools are either K-5 (17 schools) of K-6 (20 schools).[13]

## Empirical Results

The replication and extension of our earlier findings involved two distinct analytic steps: concurrently arraying the 111 schools on goal consensus and centralization of influence to describe whatever "clusters" could be observed and examining the association of those clusters with school level.

### Describing the Clusters

After experimenting with several formal numerical methods for the classification of organizations, we concluded that at this stage in the comparative study of schools it is best to avoid highly abstract statistical algorithms. In this way, at least in cases where the analysis is done in a two-dimensional space and patterns within the data are discernable to the naked eye, the data can more easily speak for themselves.[14] Thus we elected simply to partition each variable into intervals of one-half standard deviation units on either side of the mean and compute the number of schools falling into each cell of the resulting 90-cell grid.

The results reveal rather dramatically two distinct clusters, with very little ambiguity regarding which schools belong most appropriately to which cluster (Figure 1). One cluster, that in the upper right region of this two-dimensional space, is relatively high on both goal consensus and

centralization of influence and thus more like the ideal-typic rational bureaucracy. The other, in the lower left region, is low on both variables, and thus more like the ideal-typic loosely coupled system.

Although the two clusters are apparently quite distinct, one can of course question whether each corresponds to a unique image of schools. To address that question, we must move back up the ladder of abstraction from our data to the original images, and the literature provides very little guidance on how to proceed. Figure 1 helps to clarify the problem. Rather than limiting the portrayed area to the observed range of scores, one could extend it to cover the range of possible scores: 0.00 to 1.00 for goal consensus and 0.00 to 6.00 for centralization of influence. From this more expansive perspective, both clusters are located in the lower left-hand corner of the the two-dimensional space. The concentration of schools is especially prevalent with respect to centralization of influence where no school was scored higher than 2.69.

The major questions unanswered by our analyses are how high must such scores be for a school to be "a rational bureaucracy?" and how high can they reasonably be given what is known about schools, or for that matter about organizations generally? Consider, for example, centralization of influence. Our measure is based on decision areas very close to the classroom, including establishing objectives for a specific course and determining concepts taught on a given day. These are just the kinds of decisions that Lortie suggests are most likely to be controlled by teachers.[15] Moreover, given the uncertainties surrounding the technology of teaching, it is questionable whether one would ever see schools where the balance of control in these areas rests with administrators rather than

teachers.[16] However, Parsons points out that there are qualitative breaks in the hierarchy of most organizations, with different levels concerned with production processes, resource allocation, and maintenance of the legitimacy of the organization.[17] Thus, a division-of-labor that gives "workers" control over the production processes that we measure and "managers" more control over resource allocation is probably not too unlike that of many organizations. To some extent, a definitive answer to the question of what range of scores can be expected requires empirical comparison of schools with other types of organizations.

Yet, this sort of definitional exercise--are the schools in Cluster B really rational bureaucracies--can become sterile and academic. The real question is not what to call each cluster but whether differences between the two clusters have practical meaning for school administrators. Here it is important to note that there is some evidence that it is easier to implement change programs in schools where couplings are relatively tight.[18] Moreover, the effective schools research suggests that student achievement can be increased more in schools where there is agreement on the goal of basic skills instruction and where principals are strong leaders--that is, where centralization is high.[19] Thus, whether one of these clusters is the ideal-typic rational bureaucracy or not, there is good reason to believe that schools in the cluster more in the rational bureaucratic direction (i.e. Cluster B) are more amenable to administrative attempts at improvement.

Clusters and Levels

Cross-tabulation of the two clusters with school level reveals a very strong association between cluster and level. All 22 senior high schools are in Cluster A and all but one of the 56 elementary schools are in Cluster B. Seventeen of the 22 junior high schools, fall in Cluster B and five in Cluster A (Table 3). Thus, the deep "valley" observable in Figure 1 between schools relatively low on goal consensus and centralization of influence (Cluster A) and those relatively high on both variables (Cluster B) seems to define a major boundary between elementary and senior high schools as social entities.

The strong association between our two clusters and school level helps to rule out some hypotheses about what accounts for loose coupling. Weick suggests that loose coupling is a response to environmental turbulence and is facilitated by slack resources.[20] However, for schools many forms of environmental turbulence--for instance, taxpayers' revolts, changing federal regulations, and court cases--are uniform within a given jurisdiction. These issues and the distribution of funds are handled at the district level, so they are unlikely to account for the variation described in Figure 1.

What then about elementary and secondary schools might create the clustering pattern we have observed? At this time we can only begin to suggest an answer, for while elementary and secondary schools are clearly different as organizations, the reasons for such differences are difficult to document and to unravel.

Perhaps the most obvious distinction between elementary and secondary schools is in the age of their clientele. Although, there is relatively

little theoretical reason to expect student age to have a direct effect on centralization of influence, the presence of older students may reduce goal consensus, for as children mature they are exposed to a more diverse curriculum, a situation which can lead to disagreements among school staff regarding curricular priorities. Elementary schools tend to offer a relatively limited curriculum, one emphasizing primarily basic cognitive and social skills. In contrast, secondary schools tend to emphasize a broader range of curricular elements such as advanced cognitive capabilities, citizenship skills and preparation for the worlds of work and college, often in addition to remediation in basic cognitive and social skills for those students who failed to achieve mastery while in elementary school.

Other differences between elementary and secondary schools are likely to affect the clustering noted above in ways that may be equally important but far more subtle and indirect. For example, secondary schools are more likely than elementary schools to have formal departments, generally in order to permit specialized attention to their broader curriculum. In order to have a specialized staff to address a range of diverse curricular goals, senior high schools tend to be larger than junior highs which in turn tend to be larger than elementary schools. In addition to containing more specialists, the professional staffs in secondary schools are more likely to consist of experienced teachers and men. Finally, secondary schools offer a wider variety of co- and extra-curricular offerings than do elementary schools, services often provided directly to adults as well as to youth.

## Implications

This replication of our original study verifies its key findings. Schools can be arrayed into two distinct clusters, one with substantially higher goal consensus and centralization of influence than the other. Elementary schools fall almost exclusively into the first cluster and senior high schools into the second with junior high schools divided between the two. Whether the two clusters can be labeled definitively as corresponding to the rational bureaucratic and loosely coupled systems images is not as clear because the criteria for being "a rational bureaucracy" are not well developed in the educational literature. Nevertheless, the problems of managing schools within these two clusters are likely to be quite different.

These conclusions suggest a basic dilemma for those trying to reform high schools. On the one hand, they can attempt major modifications of the sort suggested by Sizer.[21] If accomplished, these changes would reduce the goal dispersion of senior high schools and make further coordinated program development more feasible. However, major reforms would seem to require basic changes in the structural arrangements, staffing, and service mix of those schools. Although such changes are possible through deliberate administrative action, current arrangements in high schools are the result of historical, cultural, and political forces that are not easily redirected. Alternatively one can hope to promote improvement within the current structure, staffing, and service mix of high schools. Such an approach avoids the big battles. However, as currently organized, high schools are not readily amenable to schoolwide improvements that will lead to big changes in what students learn even though individual teachers

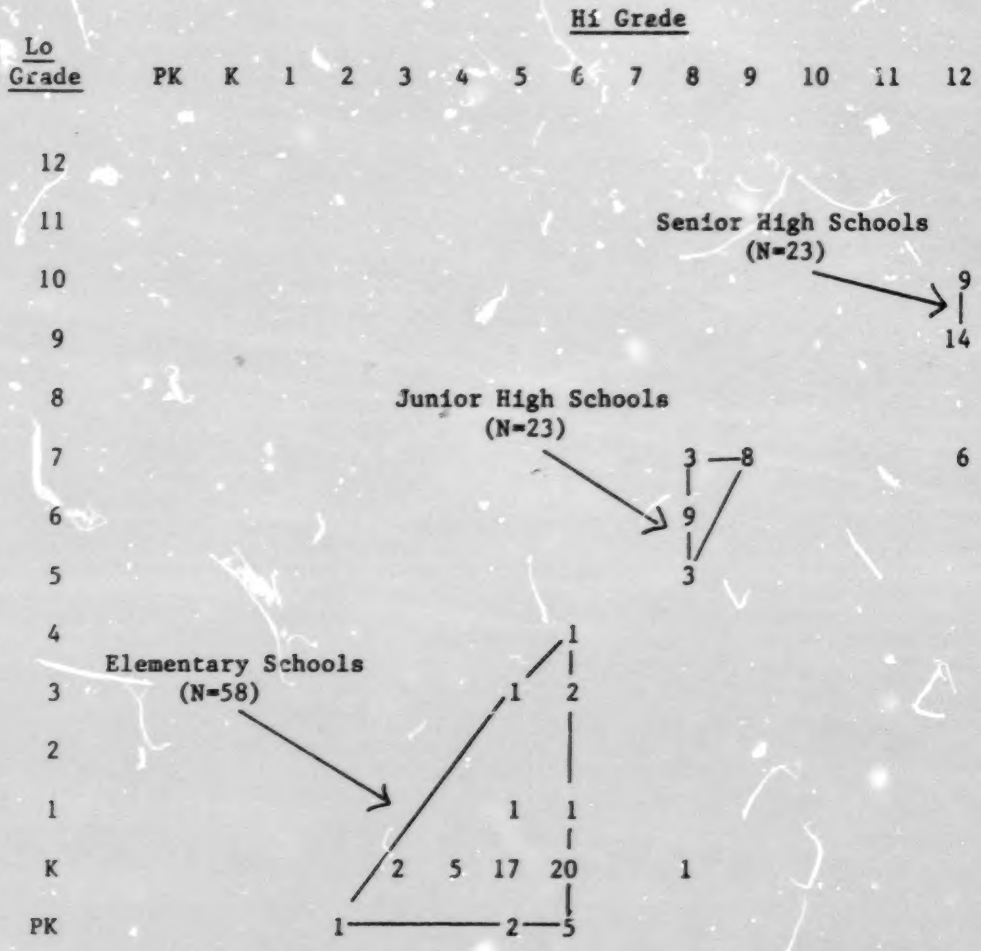
may adopt externally proposed modifications. Unless major changes are made in the structure and staffing of high schools, it seems unlikely that substantial reform will be accomplished.

Table 1. Summary Statistics for the Goal Consensus and Centralization of Influence Scores for 111 Public Schools.

| Statistic | Score: Goal Consensus | Score: Centralization of Influence |
|---|---|---|
| 1. Minimum possible score | 0.00 | 0.00 |
| 2. Maximum possible score | 1.00 | 6.00 |
| 3. Minimum observed score | 0.09 | 0.78 |
| 4. Maximum observed score | 0.68 | 2.69 |
| 5. Mean observed score | 0.36 | 1.54 |
| 6. Standard deviation of observed score | 0.15 | 0.43 |
| 7. Alpha coefficient | * | 0.83 |
| 9. Number of data items incorporated into the score | 7 | 4 |

* The use of Kendall's coefficient of concordance as the measure of goal consensus precluded the computation of an Alpha coefficient.

Table 2. Distribution of 111 Public Schools in Terms of Their Grade Span. ("Lo Grade" signifies the lowest grade enrolled in the school and "Hi Grade" the highest.)



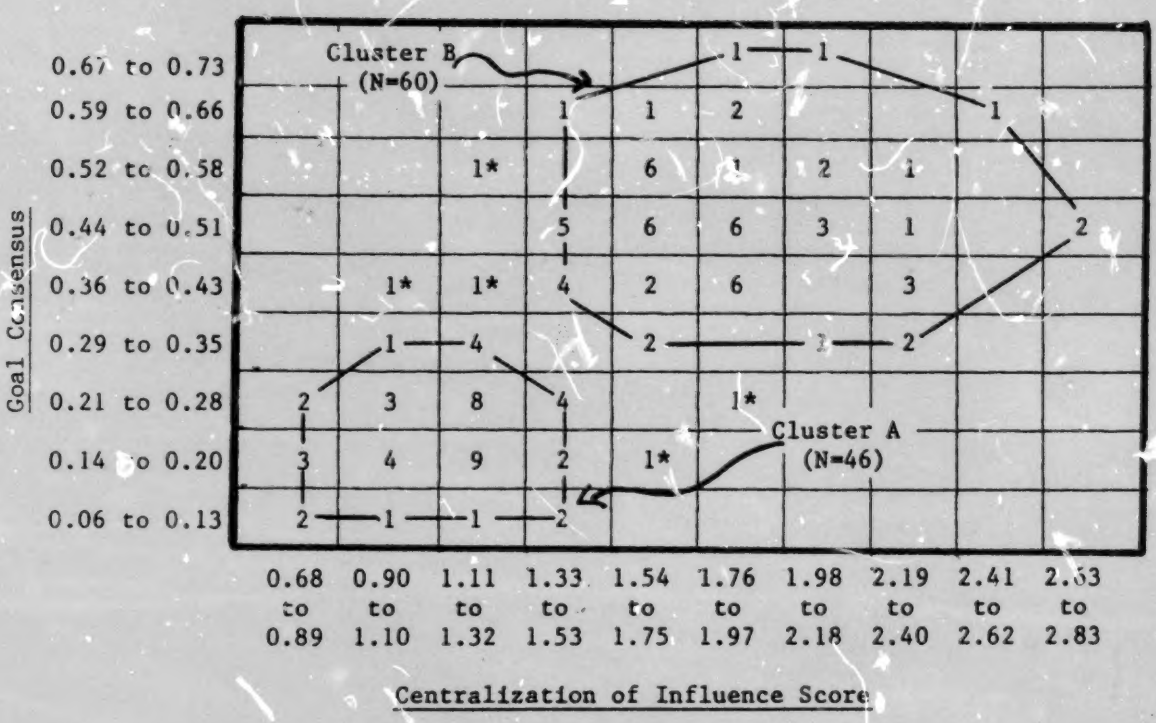



Figure 1. Scatter plot of 111 public schools on Goal Consensus and Centralization of Influence. (The five schools whose cluster membership is considered ambiguous are indicated with an asterisk.)

Table 3. Image Cluster Assignment by School Level within a Sample of 100 Public Schools

| School Level | Image Cluster Assignment | |
|---|---|---|
| | Cluster A | Cluster B |
| Senior high | 22 | 0 |
| Junior high | 17 | 5 |
| Elementary | 1 | 55 |
| All schools | 40 | 60 |

Note: The Chi-square statistic for this table is 79.81 (df = 2). In order to avoid ambiguity about proper image or level assignment six schools with ambiguous grade spans, four schools with ambiguous image-cluster membership, and one school with both were deleted from the analysis prior to constructing Table 3.

NOTES

1. W. A. Firestone and R. E. Herriott, "Two Images of Schools as Organizations: An Explication and Illustrative Empirical Test," Educational Administration Quarterly 18,2 (1982): 39-59.

2. M. Weber, The Theory of Social and Economic Organization, M. Henderson and T. Parsons, editors and translators (New York: Oxford University Press, 1947). First published in German in 1924.

3. R. K. Merton, Social Theory and Social Structure (New York: Free Press, 1968).

4. For some early speculation about "loose coupling" within schools, see C. E. Bidwell, "The School as a Formal Organization," in Handbook of Organizations, J. G. March, ed. (Chicago: Rand McNally, 1965) and D. C. Lortie, "The Balance of Control and Autonomy in Elementary Schools," in The Semi-professions and Their Organizations, A. Etzioni, ed. (New York: The Free Press, 1969). For more recent theoretical statements, see D. M. Cohen, J. G. March and J. P. Olsen, "A Garbage Can Model of Organizational Choice," Administrative Science Quarterly 17 (1972): 1-25; K. E. Weick, "Educational Organizations as Loosely Coupled Systems", Administrative Science Quarterly 21 (1976): 1-9; J. W. Meyer and B. Rowan, "Institutionalized Organizations: Formal Structure as Myth and Ceremony," American Journal of Sociology, 83 (1977): 340-63. For recent critiques of the loose coupling imagery, see R. G. Corwin, "Patterns of Organizational Control and Teacher Militancy: Theoretical Continuities in the Idea of 'Loose Coupling'," R. G. Corwin, ed., Research in Sociology of Education and Socialization, v. 2: Research in

Organizational Issues in Education (Greenwich, CT: JAI Press, 1981) and F. W. Lutz, "Tightening Up Loose Couplings in Organizations of Higher Education," Administrative Science Quarterly 27 (1982): 653-69.

5. Firestone and Herriott, "Two Images . . ."

6. For an extensive discussion of the school sampling and recruitment process, see W. A. Firestone and R. E. Herriott, An Empirical Study of the Applicability of Images of Organization to Schools. (Philadelphia: Research for Better Schools, Inc., 1982), Appendix A.

7. Unlike the random sample of schools which was selected under a special grant to Research for Better Schools, Inc. (RBS) from the National Institute of Education, this sample resulted from RBS' on-going program of technical assistance to schools in Delaware, New Jersey, and Pennsylvania. Schools entered this sample to receive management training from RBS, rather than on the basis of any formalized sampling criteria. Because of its dubious origins this sample of "volunteer" schools had to be viewed with considerable caution. However, its remarkable similarity to our earlier random sample is most encouraging--see note 8 for selected details.

8. For example, the two samples have highly similar means and standard deviations on both goal consensus and centralization of influence. Further the Pearson product moment correlation coefficients for the relationship between these two variables is .64 for the random sample of 50 schools, .66 for the 61 schools sample, and .65 for the pooled sample of 111 schools.

9. To date there have been three versions of the SODA questionnaire: SODA I was developed for the original study, SODA II (a revision and expansion

of SODA I) for the study of the random sample of 50 schools and SODA III (a revision and expansion of SODA II) for the 61 schools sample. The format for measuring goal consensus and centralization of influence was identical in the SODA II and SODA III instruments. For the SODA II administration the number of teacher informants ranged from a low of seven in a school with eight experienced teachers to a high of 69 in a school with an eligible staff of 81 teachers. The median number of teacher- informants per school was 21 and the average within-school response rate was 87 percent. See Firestone and Herriott, An Empirical Study . . ., Appendix B for details.

10. See M. G. Kendall, Rank Correlation Methods. (London: Griffin, 1948).

11. Within the random sample of 50 schools all four decision areas produced ratios of between- to within-school variance statistically significant at below the .001 level. Although decisions about the measurement properties of the centralization of influence items were made solely from results from this sample, the same operational definition of the centralization of influence score was applied to both. For greater detail about the procedures used to operationalize both goal consensus and centralization of influence within the random sample, see Firestone and Herriott, An Empirical Study . . ., Appendix B.

12. For the results of one of the few studies designed explicitly to make quantitative comparisons of elementary, junior high and senior high schools as organizations, see R. E. Herriott and B. J. Hodgkins, The Environment of Schooling: Formal Education as an Open Social System. (Englewood Cliffs, NJ: Prentice-Hall, 1973, chapter 6).

13. To facilitate the comparison of schools that could be unambiguously classified as either elementary, junior high, or senior high schools, the seven K-8 or 7-12 schools were deleted from all analyses involving school level (see Table 2).

14. All numerical taxonomic methods involve complex and often controversial assumptions about the most appropriate similarity or distance measure to employ and about the rules for cluster formation. For discussion of these issues as they apply to organizations, see B. McKelvey Organizational Systematics: Taxonomy, Evolution, Classification. (Berkely: University of California Press, 1982). Since different assumptions can lead to dramatically different outcomes, it seemed best in attempting to replicate our earlier results to make as few assumptions as possible. For the results of our effort to apply one abstract numerical method (k-mean cluster analysis) to the random sample of 50 schools, see Firestone and Herriott, An Empirical Study . . ., Part I.

15. D. C. Lortie, School teacher: A Sociological Study (Chicago: University of Chicago Press, 1975).

16. C. Perrow, Organizational Analysis: A Sociological View (Belmont, CA: Wadsworth, 1970).

17. T. Parsons, Structure and Process in Modern Societies (New York, NY: Free Press, 1965).

18. P. W. Berman and M. W. McLaughlin, Federal Programs Supporting Educational Change, Vol. VII: Factors Affecting Implementation and Continuation (Santa Monica, CA: Rand, 1977); S. Rosenblum and K. S. Louis, Stability and Change: Innovation in an Educational Context (New York: Plenum, 1981); H. D. Corbett, J. L. Dawson, and W. A. Firestone, To Each

Its Own: School Context and School Change (Philadelphia: Research for Better Schools, 1982).

19. R. Edmunds, "Effective Schools for the Urban Poor", Educational Leadership 37 (1979): 15-23, D. Clark, L. S. Lotto and M. M. McCarthy, "Factors Associated with Success in Urban Elementary Schools" Phi Delta Kappan 61, 7(1980): 467-70

20. K. Weick, "Loosely Coupled Systems".

21. T. R. Sizer, "High School Reform: The Need for Engineering", Phi Delta Kappan. 64, 10(1983): 679-83.